Hotel, when the proposals for the reconstruction and re-equipment of the engineering laboratories at University College, London, will be explained by the treasurer, Sir Ernest Moir, and others. It will be remembered that an appeal for 100,000*l.* towards this object was recently issued. Already more than 33,000*l.* has been collected—that is, about one-third of the total sum required. It is urgently necessary that the whole fund should be subscribed by June at the latest, in order that the buildings may be put in hand. Further donations should be sent to H.R.H. Prince Arthur of Connaught at 42 Upper Grosvenor Street, W.1.

IN *School Hygiene* (vol. xi., No. 1, February) Dr. A. A. Mumford puts forward an interesting scheme for the investigation and standardisation of the physical efficiency of children which is characterised by the breadth of view we should expect from the author of the "History of the Manchester Grammar School." Grading his subjects in six age-groups from two to eighteen, he indicates the materialistic tests which are appropriate. A boy of about thirteen, for example, should be able to run 100 yards in 14 seconds; for the oldest boys Flack's manometer test of expiratory force is of value. But realising, as medicine has come to realise more and more in recent years, the influence of the mind on the body, he emphasises the necessity of studying the emotional incentives to be found in the imagination, and would have the school medical officer pay attention to sulkiness as much as to adenoids. In the discussion of the paper Dr. Lempriere, of Haileybury, describes the quick, practical utility of height-weight ratios as indices of physical progress. Athletes are taller and heavier than the average, "crocks" shorter and lighter; it is, perhaps, characteristic that nothing is said about the physical qualities of the scholars and dunces.

Societies and Academies.

LONDON.

Royal Society, February 19.—Sir J. J. Thomson, president, in the chair.—B. **Moore** and T. A. **Webster**: Studies of photosynthesis in fresh-water algæ. (1) The fixation of both carbon and nitrogen from the atmosphere to form organic tissue by the green plant-cell. (2) Nutrition and growth produced by high gaseous dilutions of simple organic compounds, such as formaldehyde and methylic alcohol. (3) Nutrition and growth by means of high dilutions of carbon dioxide and oxides of nitrogen without access to atmosphere. The primeval living organism, like the inorganic colloidal systems which were its precursors, must have possessed the power of fixing carbon and nitrogen, and building these up into reduced organic compounds with uptake of energy. The source of the energy was sunlight. This power is still possessed by the lowliest type of synthesising cell existing, namely, the unicellular alga. A synthesising cell must have existed prior to bacteria and other fungi, since these can exist only upon organic matter, and the primeval world before the advent of life could contain no organic matter. Their specific reactions show that even the ultra-microscopic filter-passing organisms are highly organised products on the path from the inorganic towards life, and hence it follows that there is a long intermediate range of evolution. The first synthesising system acting upon light was thus probably an inorganic colloidal system in solution, capable of adsorbing the simple organic substances which it synthesised. It is therefore futile to search for the origin of life at the level of bacteria and torulæ. As complexity increased with progressive evolution, more and more rapid transformers for the capture of the energy of sunlight came into existence. Such transformers are found in the green cell for fixation of both carbon and nitrogen. The earlier transformers in the inorganic colloidal systems can only utilise light of short wave-lengths; the later transformers in the living cells are adapted to utilise longer wave-lengths; and the very short wave-lengths, which are lethal, are cut off by their colour-screens of chlorophyll, etc.—W. M. **Bayliss**: The properties of colloidal systems. iv.: Reversible gelation in living protoplasm. With intense dark-ground illumination it is possible to see that the apparently clear pseudopodia of Amœba are filled with numerous very minute particles in Brownian movement, thus affording further evidence of the liquid, hydrosol nature of simple protoplasm. By electrical stimulation this sol can be reversibly changed into the gel state, evidenced by the sudden cessation of the Brownian movement.—F. J. **Wyeth**: The development of the auditory apparatus in *Sphenodon punctatus*. This memoir contains a detailed and fully illustrated account of the development of the auditory apparatus and associated structures in the New Zealand Tuatara. As this important type is on the verge of extinction, it was thought desirable to treat the subject fully, although, as might be expected, the developmental history agrees closely with that found in other reptiles. The work was carried out chiefly by means of wax-plate reconstruction models. The third and fourth visceral clefts are closed by a backwardly growing operculum, but separate dorsal and ventral openings of the clefts were not observed. The existence of two pairs of head-cavities was confirmed, those of each pair communicating with each other by transverse canals. The vascular system was found to exhibit a number of primitive features. The region investigated includes cranial nerves vi.-xii., the development of which was worked out in detail. The general development of the internal ear and auditory nerve is thoroughly normal. The development of the cristæ and maculæ acusticæ from the primitive neuroepithelium is given in detail. A well-marked macula neglecta is found. As regards the much-debated question of the origin of the columellar apparatus, evidence is brought forward in support of the contention that this is essentially a derivative of the hyoid arch, and it is maintained that the auditory capsule contributes at most a portion of the foot-plate of the stapes.

Linnean Society, February 19.—Dr. A. Smith Woodward, president, in the chair.—Major H. C. **Gunton**: Entomological-meteorological records of ecological facts in the life of British Lepidoptera. The author believed that interesting facts would be obtained by recording and plotting the results of observations made by a number of entomologists in various localities. The scheme exhibited was derived from his notes from February to December, 1919, within a radius of four miles from Gerrard's Cross, Bucks, which includes oak and beech woods, heath, marsh, and cultivated land. Special signs are used to denote the occurrence of species of macro-Lepidoptera on sallow-bloom in the spring, ivy in the autumn, sugar, and light. Thirty-five species of butterflies and two hundred and forty species of moths are thus tabulated and correlated with meteorological data. The diagram places many facts before the eye, as the long continuance of certain species, the presence of more than one brood, and the like. Sugar scarcely appeals when honey-dew is abundant, and artificial light is ineffective during bright moonlight. Other problems, as of immigration, still await solution.

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PARIS.

Academy of Sciences, February 9.—M. Henri Deslandres in the chair.—P. A. **Dangeard**: The plastidome, vacuome, and spherome in *Selaginella Kraussiana*.—G. **Charpy**: The minute fissures in steel ingots. The mode of formation and method of detection of minute cavities in steel ingots are described, together with an account of their alteration during rolling and forging.—M. Leclerc du Sablon was elected a correspondant for the section of botany in succession to the late M. Farlow, and M. Luglon correspondant for the section of mineralogy in succession to M. Walcott, elected foreign associate.—C. **Rabut**: The reduction of contact transformations.—R. **Birkeland**: A reduction of Abelian integrals.—J. **Bourquart**: The Quaternary glaciation of Central Albania.—L. and E. **Bloch**: Some new spark spectra in the extreme ultra-violet. Measurements for wavelengths between 1855 and 1500 Å.U. are given for the ultra-violet spectra of cadmium, bismuth, nickel, and silver.—J. A. **Le Bel**: New observations on catathermic phenomena.—D. **Gauthier**: The synthesis of α-ketonic tertiary alcohols. A correction relating to the constitution of a body previously described.—J. **Guyot** and L. J. **Simon**: The action of water on methyl chlorosulphonate.—A. **Mailhe** and F. **de Godon**: The catalytic formation of ether oxides. Calcined alum is an excellent reagent for the conversion of ethyl alcohol into ether, with a yield of 71 per cent. This reaction has been extended to propyl alcohol (yield of ether 54 per cent.), isopropyl alcohol (yield 10 per cent.), isoamyl alcohol (yield 28 per cent.), and mixtures of alcohols. In the last case mixed ethers can be prepared.—P. **Bertrand**: The normal succession of the coal flora in the Gard coal basin.—L. **Besson**: Extraordinary haloes.—A. **Loubière**: The fungi of Brie cheese.—E. F. **Galiano**: The histology of the branchial hearts of *Sepia officinalis* and their appendices.—V. **Galippe**: Researches on the evolution of the protoplasm of certain plant-cells by the method of culture.—G. **Bertrand** and M. **Brocq-Rousseu**: The destruction of rats by chloropicrin. Both the rat and the rat-flea are readily destroyed by the vapour of chloropicrin, and, as this substance is without action upon cloth materials and dyes, it can be utilised for the destruction of rats in ships.

Books Received.

A Course of Practical Chemistry for Agricultural Students. By L. F. Newman and Prof. H. A. D. Neville. Vol. i. Pp. 235. (Cambridge: At the University Press.) 10*s*. 6*d*. net.

A Treatise on the Mathematical Theory of Elasticity. By Prof. A. E. H. Love. Third edition. Pp. xviii+624. (Cambridge: At the University Press.) 37*s*. 6*d*. net.

Pastimes for the Nature Lover. By Dr. S. C. Johnson. Pp. 136. (London: Holden and Hardingham, Ltd.) 1*s*. net.

Department of Applied Statistics, University of London, University College. Drapers' Company Research Memoirs. Biometric Series. X.: A Study of the Long Bones of the English Skeleton. By Karl Pearson and Julia Bell. Part i.: The Femur. Text, chaps. i. to vi., pp. v+224; Atlas, pp. vii+plates lix; and Tables of Measurements and Observations. Part i., section ii. Text, pp. 225–539; Atlas, pp. vii+plates lx–ci. (Cambridge: At the University Press.) Part i., Text and Atlas, 30*s*. net; part i., section ii., Text and Atlas, 40*s*. net.

Tanks in the Great War, 1914–1918. By Brevet-Col. J. F. C. Fuller. Pp. xxiv+331+vii plates. (London: John Murray.) 21*s*. net.

The Heron of Castle Creek, and other Sketches of Bird Life. By A. W. Rees. Pp. 218. (London: John Murray.) 7*s*. 6*d*. net.

The Soil: An Introduction to the Scientific Study of the Growth of Crops. By Sir A. D. Hall. Third edition. Pp. xv+352. (London: John Murray.) 7*s*. 6*d*. net.

Medieval Medicine. By Prof. J. J. Walsh. Pp. xii+221. (London: A. and C. Black, Ltd.) 7*s*. 6*d*. net.

Laboratory Manual of Elementary Colloid Chemistry. By E. Hatschek. Pp. 135. (London: J. and A. Churchill.) 6*s*. 6*d*.

Euclid in Greek. Book i. With Introduction and Notes. By Sir Thomas L. Heath. Pp. ix+239. (Cambridge: At the University Press.) 10*s*. net.

Sleeping for Health. By Dr. E. F. Bowers. Pp. 128. (London: G. Routledge and Sons, Ltd.) 2*s*. 6*d*. net.

Animal Foodstuffs: Their Production and Consumption, with Special Reference to the British Empire. By Dr. E. W. Shanahan. Pp. viii+331. (London: G. Routledge and Sons, Ltd.) 10*s*. 6*d*. net.

Intermediate Text-book of Magnetism and Electricity. By R. W. Hutchinson. Pp. viii+620. (London: W. B. Clive.) 8*s*. 6*d*.

The Mineralogy of the Rarer Metals. By E. Cahen and W. O. Wootton. Second edition. Revised by E. Cahen. Pp. xxxii+246. (London: G. Griffin and Co., Ltd.) 10*s*. 6*d*.

The Running and Maintenance of the Marine Diesel Engine. By J. Lamb. Pp. xii+231+4 plates. (London: C. Griffin and Co., Ltd.) 8*s*. 6*d*.

Memoirs of the Geological Survey, Scotland. Special Reports on the Mineral Resources of Great Britain. Vol. xi.: Iron Ores (continued). The Iron Ores of Scotland. By M. Macgregor and others. Pp. vii+240. (Edinburgh: H.M.S.O.; Southampton: Ordnance Survey Office.) 10*s*. net.

Motion Study for the Handicapped. By F. B. Gilbreth and Dr. L. M. Gilbreth. Pp. xvi+165. (London: G. Routledge and Sons, Ltd.) 8*s*. 6*d*. net.

Qualitative Analysis in Theory and Practice. By Prof. P. W. Robertson and D. H. Burleigh. Pp. 63. (London: E. Arnold.) 4*s*. 6*d*. net.

Tychonis Brahe Dani Opera Omnia. Edidit J. L. E. Dreyer. Tomus vi. Pp. v+375. (Hauniæ: Libraria Gyldendaliana.)

Moses: The Founder of Preventive Medicine. By P. Wood. Pp. xi+116. (London: S.P.C.K.) 4*s*. net.

Manual of American Grape-Growing. By W. P. Hedrick. Pp. xiii+458+xxxii plates. (New York: The Macmillan Co.; London: Macmillan and Co., Ltd.) 15*s*. net.

Diary of Societies.

THURSDAY, MARCH 4.

ROYAL INSTITUTION OF GREAT BRITAIN, at 3.—Lt.-Col. E. Gold: The Upper Air: (i) Modern Methods of Investigation, and their Application in the War.

ROYAL SOCIETY, at 4.30.—Dr. F. F. Blackman: The Protoplasmic Factor in Photosynthesis.—G. E. Briggs: The Beginning of Photosynthesis in the Green Leaf.—Prof. B. Moore, E. Whitley, and T. A. Webster: Sunlight and the Life of the Sea.

LINNEAN SOCIETY, at 5.—Dr. A. B. Rendle, E. G. Baker, and S. L. Moore: A Contribution to the Flora of New Caledonia based upon the Collections of R. H. Compton in 1914.

ROYAL COLLEGE OF PHYSICIANS, at 5.—Dr. A. Castellani: The Higher Fungi in relation to Human Pathology (Milroy Lecture).

ROYAL INSTITUTE OF PUBLIC HEALTH, at 5.—Dr. T. G. Maitland: Hospital Treatment of Pulmonary Tuberculosis

ROYAL SOCIETY OF MEDICINE, at 5.30.—Dr. W. Edgecomb: Visceral Fibrositis.—Discussion on paper by Dr. Ferreyrolle: Immunity and Mineral Water Treatment.

CHEMICAL SOCIETY, at 8.—E. H. Rennie, W. T. Cooke, and H. H. Finlayson: An Investigation of the Resin from Species of Xanthorrhœa Not Previously Examined.—L. S. Bagster: The Reaction between Nitric Acid and Copper.—M. Chikashige: Ancient Oriental Chemistry and

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